

# Claims

- [c1] 1.A flexible detector array transmission circuit for an x-ray imaging system comprising:  
at least one mono-directional conductive layer electrically coupled to at least one detector; and  
a plurality of flexible circuit layers electrically coupled to said at least one mono-directional conductive layer, said plurality of flexible circuit layers directing x-ray signals generated by said at least one detector to a data acquisition system.
- [c2] 2.A circuit as in claim 1 further comprising at least one insulation layer disposed between said plurality of flexible circuit layers.
- [c3] 3.A circuit as in claim 1 further comprising a plurality of detector bonding pads electrically coupled to said at least one mono-directional conductive layer and to said at least one detector.
- [c4] 4.A circuit as in claim 1 further comprising a plurality of flexible circuit bonding pads electrically coupled to said at least one mono-directional conductive layer and to said plurality of flexible circuit layers.

- [c5] 5.A circuit as in claim 1 further comprising:  
a plurality of flexible circuit bonding pads electrically coupled to said at least one mono-directional conductive layer and to said first flexible circuit layer; and  
a plurality of electrical via coupling said plurality of flexible circuit bonding pads and said at least one mono-directional conductive layer;  
wherein said plurality of flexible circuit layers comprise a first flexible circuit layer and a second flexible circuit layer.
- [c6] 6.A circuit as in claim 1 wherein said plurality of flexible circuit layers comprise a plurality of parallel fine line connections.
- [c7] 7.A circuit as in claim 1 wherein said at least one detector is a backlit diode.
- [c8] 8.A circuit as in claim 1 wherein said plurality of parallel fine line connections are separated by an insulation material.
- [c9] 9.A circuit as in claim 1 wherein the flexible detector array transmission circuit is formed using a heat and pressure application method.
- [c10] 10.A circuit as in claim 1 further comprising at least one

electrically conductive substrate layer electrically coupled to said at least one detector and to said at least one mono-directional conductive layer.

[c11] 11.A flexible detector array transmission circuit for an x-ray system comprising:

at least one electrically conductive substrate layer electrically coupled to at least one detector;

at least one mono-directional conductive layer electrically coupled to said at least one electrically conductive substrate layer; and

at least one flexible circuit layer electrically coupled to said at least one mono-directional conductive layer, said at least one flexible circuit layer directing generated x-ray signals from said at least one detector to a data acquisition system of the x-ray system.

[c12] 12.A circuit as in claim 11 wherein said at least one electrically conductive substrate layer is a rigid support for alignment and bonding of electrical connections between said at least one detector and said at least one flexible circuit layer.

[c13] 13.A circuit as in claim 11 wherein said at least one electrically conductive substrate layer comprises at least one electrical routing pattern between said at least one detector and said at least one flexible circuit layer.

- [c14] 14. An x-ray imaging system comprising:  
a source generating an x-ray beam;  
at least one detector receiving said x-ray beam and generating projection data;  
a flexible detector array transmission circuit comprising;  
at least one mono-directional conductive layer electrically coupled to said at least one detector; and  
a plurality of flexible circuit layers electrically coupled to said at least one mono-directional conductive layer; and  
an image reconstructor electrically coupled to said flexible detector array transmission circuit, receiving said projection data from said at least one detector, and reconstructing an image in response to said projection data.
- [c15] 15. A system as in claim 14 further comprising at least one isolation layer disposed between said plurality of flexible circuit layers.
- [c16] 16. A system as in claim 14 further comprising a plurality of detector bonding pads electrically coupled to said at least one mono-directional conductive layer and to said at least one detector.
- [c17] 17. A system as in claim 14 further comprising a plurality of flexible circuit bonding pads electrically coupled to

said at least one mono-directional conductive layer and to said plurality of flexible circuit layers.

[c18] 18.A system as in claim 14 further comprising:  
a plurality of flexible circuit bonding pads electrically coupled to said at least one mono-directional conductive layer and to said first flexible circuit layer; and  
a plurality of electrical via coupling said plurality of flexible circuit bonding pads and said at least one mono-directional conductive layer;  
wherein said plurality of flexible circuit layers comprise a first flexible circuit layer and a second flexible circuit layer.

[c19] 19.A system as in claim 14 further comprising at least one electrically conductive substrate layer electrically coupled to said at least one detector and to said at least one mono-directional conductive layer.

[c20] 20.A system as in claim 19 wherein said at least one electrically conductive substrate layer comprises at least one electrical routing pattern between said at least one detector and said plurality of flexible circuit layers.